STAFF REPORT

LINCOLN CENTER ENVIRONMENTAL REMEDIATION TRUST
GROUNDWATER TREATMENT SYSTEM
SAN JOAQUIN COUNTY

A renewed NPDES Permit and new Time Schedule Order (TSO) are being considered for adoption for the Lincoln Center Environmental Remediation Trust, Groundwater Treatment System in San Joaquin County.

BACKGROUND

As part of a settlement of legal proceedings in the United States District Court, Eastern District of California, the Lincoln Center Environmental Remediation Trust (Discharger) was created to manage environmental remediation activities at the Lincoln Center Site in the City of Stockton, San Joaquin County, California. The Discharger owns and operates a ground water extraction and treatment system to remove volatile organic compounds (VOCs), petroleum products, and lead from ground water. The treatment system is designed for a flow of 0.43 million gallons per day (mgd) of extracted groundwater, and operates at an average flow of 0.25 mgd. Effluent from the treatment unit is discharged to the storm sewer system that is owned and operated by San Joaquin County. The storm sewer system discharges to Fourteen Mile Slough. Fourteen Mile Slough is part of the Sacramento-San Joaquin Delta (Delta) and both are waters of the United States. The discharge of treated groundwater is currently regulated by Waste Discharge Requirements (WDRs) Order No. 98-062, adopted by the Regional Board on 17 April 1998. This proposed Order includes new effluent limitations. Immediate compliance with the new effluent limitations for arsenic, chromium VI, mercury, specific conductance, barium, iron, ammonia, and manganese is not possible or practicable. Time schedules for compliance with the new chromium VI and mercury effluent limitations are included within the proposed Order. This proposed Order includes a companion Time Schedule Order which provides a time schedule for the Discharger to develop, submit, and implement methods to optimize this remediation system to cleanup the groundwater faster and more efficiently, and/or reduce the volume of treated groundwater and find alternative means of disposal or reclamation with in the life of the permit term, or construct necessary treatment facilities to meet these new effluent limitations.

ISSUES

On 23 February 2005, the Discharger provided comments to the Tentative Orders. Responses to these comments will be included in a separate Response to Comments document. The more significant issues are summarized below:

Municipal and Domestic Supply (MUN) Beneficial Use

Effluent from the treatment unit is discharged to the storm sewer system that is owned and operated by San Joaquin County. The storm sewer system discharges to the Fourteen Mile Slough. Fourteen Mile Slough is part of the Sacramento-San Joaquin Delta (Delta). The beneficial uses of the Delta as identified in Table II-1 of the Basin Plan include domestic and municipal supply (MUN). Many of the new effluent limitations in the proposed Order are a result of the MUN beneficial use and application of the chemical constituents objective.

The Discharger provided comments that the Regional Board automatically designated the MUN beneficial use and, due to the weak hydrologic connection between the Trust's minimal discharge and flows to the San Joaquin River, the establishment of effluent limitations for protection of a non-

existent MUN beneficial use in the Slough is unnecessary and inappropriate for this discharge of treated groundwater.

In considering application of the MUN use, Regional Board staff notes that limited information is available regarding water flows and quality in Fourteen Mile Slough at the point of discharge. As noted during a site visit by Regional Board staff, there are periods of limited or no flow at the point of discharge. Downstream, the discharge contributes directly to increasing volumes of water in Fourteen Mile Slough which are under tidal influence. What dilution and/or assimilative capacity may be available immediately or further downstream is unknown.

Fourteen Mile Slough is part of the Delta system, and the discharge contributes pollutants to the Delta. The point of discharge from the groundwater treatment plant to Fourteen Mile Slough is within the legal boundary of the Delta, and MUN is an existing use of the Delta. Although drinking water intakes are not currently in close proximity to the point of discharge, increasing population in the Central Valley and Stockton urban area will substantially increase the demands for drinking water. In January 2003 the City of Stockton published a Feasibility Report in support of the Delta Water Supply Project. This Project is designed to provide additional water supplies to meet the projected demands of the City of Stockton Metropolitan Area. In this Feasibility Report the City of Stockton evaluated four potential intake sites for key environmental issues including fisheries, land use, biological resources, and cultural resources. Each intake location went through a preliminary design and operations evaluation that included screening requirements, water quality, and maintenance issues. The environmental evaluation found no substantial, "fatal flaw" in land use or biological constraints affecting the four surface water diversion points. These four potential intake locations included the southwest tip of Empire Tract, the Little Connection Slough, Honker Cut, and the western tip of Wright Tract at the confluence of the Fourteen Mile Slough and the San Joaquin River.

While the intake site at the confluence of Fourteen Mile Slough and the San Joaquin River may not be selected as part of this process, this effort does demonstrate that waters in proximity to the discharge are considered suitable for the MUN use and may be used for such use in the future. Regional Board staff has considered this information, and determined that any consideration to dedesignate Delta waters is not a reasonable alternative.

Consideration of Secondary Maximum Contaminant Levels (MCLs) in Establishing Effluent Limitations

The proposed Order includes effluent limitations for iron, manganese, and specific conductance considering the MUN beneficial use and secondary MCLs from the Basin Plan chemical constituents objective. The Discharger commented that MCLs referenced by the chemical constituents objective apply to public water systems (i.e. water suppliers) and are intended only to apply to drinking water treatment facilities at the tap or point-of-use, not as receiving water objectives. The Discharger commented that it is unnecessary and inappropriate to impose end-of-pipe effluent limits based on the recommended levels based solely on consideration of these non-binding taste and odor requirements.

For waters designated as MUN, the Basin Plan specifies that, at a minimum, waters shall not contain concentrations of constituents that exceed MCLs prescribed by the California Code of Regulations Title 22 (CCR Title 22), which are incorporated by reference in the Basin Plan. These include secondary MCL's. The Basin Plan notes that this incorporation-by-reference is prospective, including future changes to the incorporated provisions as the changes take effect. The Basin Plan further states that, to protect all beneficial uses, the Regional Board may apply limits more stringent than MCLs. As noted previously, there are periods of limited or no flow at the point of discharge to Fourteen Mile Slough. Previous State Water Resources Control Board (SWRCB) Orders including Water Quality Order 2002-0015, Vacaville's Easterly Wastewater Treatment Plant (at pages 53 and 54) have found that use of secondary MCLs in establishing effluent limitations is appropriate.

The Discharger also commented that the Regional Board incorrectly applied the secondary MCLs as total objectives instead of dissolved objectives, as the water will undergo federally mandated treatment. The U.S. EPA's document "Technical Notes on Drinking Water Methods" (EPA-600/R-94-173) notes that for the most common spectrochemical analytical techniques used for compliance measurements of metals, samples must not be filtered prior to either sample digestion or direct analysis. While municipal use of surface water normally requires treatment pursuant to state and federal Safe Drinking Water Acts, domestic use may not. A water delivery system that serves a single household is not regulated under these statutes. Therefore, it cannot be assumed that domestic use of water will involve treatment, such as particulate removal. Furthermore, to assume that water will be treated prior to use has the effect of transferring the cost of treatment from the discharger of waste to the user of water, which cannot be supported by state law.

Relative to the effluent limitation for specific conductance, the Discharger commented that specific conductance is addressed in (CCR Title 22) Table 64449-B in terms of a range of values for recommended, upper, and short term levels, and that Section 64449 (f) specifically provides that "[f]or constituents shown on Table 64449-B, no fixed consumer acceptance levels have been established." The Discharger commented that the table describes 900 micromhos as a "recommended" level, 1,600 micromhos as an "upper" level, and 2,200 micromhos as a "short term" level, and that neither existing nor new services are required by regulation to be lower than the 1,600 micromhos "upper" level. Regional Board staff notes, however, that Section 64449 (f) (2) also states that "Constituent concentrations ranging to the Upper contaminant level are acceptable if it is neither reasonable nor feasible to provide more suitable waters." Use of the upper or short term level in this instance again shifts the burden of what is reasonable or feasible from the discharger of waste to the user of water.

Basin Plan Objectives

The Basin Plan Table 111-1 at page III-3.00 establishes Trace Element Water Quality Objectives for arsenic, barium, iron, and manganese that apply to waters in the Delta. These objectives are expressed as maximum dissolved concentrations. Considering these objectives, and monitoring data provided by the Discharger, the proposed Order includes effluent limitations for arsenic, barium, iron, and manganese.

The Discharger commented that the existing arsenic and barium water quality objectives are not appropriate because their original adoption in 1975 was essentially a clerical error and that the Board really intended to adopt a different objective. Regional Board NPDES Staff coordinated discussion of these issues with Regional Board Basin Planning Staff, and disagrees with this conclusion. The arsenic objective that was adopted by the Regional Board in 1975 was based on previous Basin Plan objectives, guidance from State Board, consideration of available technical information, consideration of existing water quality policies including Resolution 68-16, staff recommendations and stakeholder input. There is no reason to conclude that the 0.01 mg/l objective that was included in the Basin Plan in 1975 was somehow a mistake.

The Delta Plan adopted by the Regional Board in 1967 included a 0.01 mg/l objective for arsenic. The rationale, as explained in the Plan, was that this objective was appropriate because it was being met in the Delta and that this objective would protect beneficial uses. The 1971 Interim Plan objective for arsenic was 0.01 mg/l. State Board Guidance issued in 1973 recommended 0.01 mg/l for arsenic for both protection of aquatic life and drinking water. An Appendix to the 1975 Basin Plan included a staff recommendation to change the 0.01mg/l objective to 0.1 mg/l. (The appendix is confusing because it says that the 1971 Plan objective was 0.1 mg/l and really it was 0.01 mg/l) As is the case today, the Regional Board does not always adopt the staff recommendations. A cursory review of the existing record indicates that some stakeholders (i.e., Sacramento County for example) were concerned that the proposed objectives for inorganic chemicals (excluding copper and iron) were too high because the objectives were far above existing background. At the hearing in 1975, the Regional Board adopted the Basin Plan and an addendum to the Basin Plan. The addendum included late revisions to the Basin Plan that were developed in response to testimony received at the hearing and written comments received before and after the public hearing. Included in the addendum was the 0.01 mg/l arsenic objective. There is no doubt that the Regional Board meant to adopt 0.01 mg/l as the arsenic objective.

The situation for barium is similar to arsenic. The Delta Plan and the Interim Basin Plan included an objective of 0.1 mg/l. An Appendix to the 1975 Basin Plan included a staff recommendation to change the objective. The addendum (essentially late revisions) to the draft Basin Plan included the 0.1 mg/l barium objective. The addendum was adopted by the Regional Board in response to testimony received at the hearing and written comments. There is no evidence to support the conclusion that the 0.1 mg/l barium objective was a clerical error or a mistake.

Arsenic

This proposed Order includes an average monthly effluent limitation (AMEL) for arsenic (total recoverable). The Discharger commented that the AMEL based upon the U.S. EPA's maximum contaminant level ("MCL") is inappropriate, because the Office of Administrative Law has previously disapproved the use of U.S. EPA MCLs not specified in the Basin Plan. The Discharger further commented that the federal MCL also is not otherwise appropriate for use via the narrative chemical constituents objective.

At page III-3.00 the Basin Plan Chemical Constituents Objective states: "To protect all beneficial uses the Regional Water Board may apply limits more stringent than MCLs." At page III-8.00 the

Basin Plan Toxicity Objective states: "All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life". The Basin Plan further states: "The Regional Water Board will also consider all material and relevant information submitted by the discharger and other interested parties and numerical criteria and guidelines for toxic substances developed by the State Water Board, the California Office of Environmental Health Hazard Assessment, the California Department of Health Services, the U.S. Food and Drug Administration, the National Academy of Sciences, the U.S. Environmental Protection Agency, and other appropriate organizations to evaluate compliance with this objective."

On January 22, 2001 the U.S. EPA adopted a new standard for arsenic. Public water systems must comply with the 10 μg/L MCL beginning January 23, 2006. After publishing the final arsenic rule on January 22, 2001, U.S. EPA postponed the effective date of the rule until February 22, 2002, requested public comment on the standard, and began reviewing the new standard, the science, costs and benefits analyses that supported the regulation. As announced by the Administrator on 31 October 2001, U.S. EPA will not further postpone the January 2001 rule, and U.S. EPA also does not expect to take any other additional action relative to the July 2001 proposal in the interim (April 17, 2002 Federal Register notice, 67 FR 19030, footnote 3 of Table III-2 at 19037). Reports and recommendations on the science, cost of compliance, and benefits analyses in support of the 10 μg/L final arsenic in drinking water rule were made available for review and public comment until October 31, 2001. These reports were prepared by independent, expert panels convened by the National Academy of Sciences, the National Drinking Water Advisory Council, and the U.S. EPA Science Advisory Board.

The current DHS Primary MCL for arsenic identified in Title 22 of the California Code of Regulations is 50 μg/L. By federal law, MCL's established by DHS must be at least as stringent as the federal MCL if one exists. The California Health and Safety Code Section 116361 required the Department of Health Services to adopt a new drinking water standard for arsenic by 30 June 2004. Meeting that date was not possible because a Public Health Goal (PHG) was unavailable. In April 2004, the California Office of Environmental Health Hazard Assessment (OEHHA) established a PHG for arsenic of 0.004 μg/L. The PHG is based on risks associated with cancers of the lung and urinary bladder. State law requires DHS to establish an MCL for arsenic at a level as close as technically and economically feasible to the PHG.

Considering; the MUN beneficial use, the chemical constituents and toxicity objectives of the Basin Plan, information from the National Academy of Sciences, the National Drinking Water Advisory Council, the U.S. EPA Science Advisory Board, the California Office of Environmental Health Hazard Assessment, results of effluent and receiving water monitoring, and the fact that the DHS MCL must be at least as stringent as the federal MCL, the opinion of Regional Board Staff is that the 10 μg/L concentration (total recoverable) is an appropriate effluent limitation.

Ambient Groundwater Constituents

The discharge consists of pumped groundwater treated via air stripping and granular activated carbon to remove VOC's, therefore the effluent retains the inorganic salts and trace metal characteristics of the groundwater. The Discharger provided comments that the constituents that the

Regional Board has proposed to stringently regulate naturally occur in groundwater – they are not waste products created by human or industrial processes. The Discharger commented that as a result, these constituents are not "pollutants" as defined under the CWA, citing as an example the Ninth Circuit Court of Appeals ruling in *Association to Protect Hammersly, Eld & Totten Inlets v. Taylor Resources* (APHETI-9th Cir. 2002).

The discharge from the groundwater treatment system is a point source discharge to surface water, associated with human activities that can be controlled. In a later case, the Ninth Circuit Court of Appeals found in *Northern Plains Resource Council v. Fidelity Exploration and Development Company* (Northern Plains-9th Cir. 2003), that "Pollution" is the "man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water" and the discharge of unaltered groundwater to a waters of the U.S., which alters the quality of that water, causes "pollution". The court found that "The requirement that the physical, biological, or chemical integrity of the water be a "man-induced" alteration refers to the affect of the discharge on the receiving water; it does not require that the discharged water be altered by man." The Court noted that "APHETI cannot sensibly be read to require human transformation of all materials identified in the CWA definition of "pollutant"... It is the introduction of these contaminants, not their transformation by humans, that renders them pollutants. Also, by allowing the degradation of the quality of receiving waters, the consequences of Fidelity's interpretation of APHETI would upset the integrity of the CWA, a result that APHETI was careful to avoid." Considering this information, Regional Board staff finds that groundwater constituents that are naturally occurring may be considered pollutants subject to limitations under this proposed Order.

Disposal/Reuse or Treatment Alternatives
The Discharger commented that achieving the unnecessarily stringent discharge requirements described in the proposed Orders appears infeasible. The Discharger commented that it appears that any modifications required to meet the new limits would, at a minimum, be tremendously costly and likely require the use of significant amounts of additional property than the trust has rights to use, and there does not appear to be any feasible and cost-effective alternatives available for disposition of the groundwater produced by the groundwater treatment system.

The Discharger provided the following preliminary information regarding potential disposal options:

> **Sanitary Sewer**: Discharge to the City of Stockton POTW could potentially be utilized by the Trust… This type of long-term discharge permit has not been approved previously by the City and is unlikely to be approved... Based on recent discussions with the City, the costs of a connection fee and use fee (based on volume) would be on the order of $42,000 per month or $500,000 per year for the current discharge of 240 gallons per minute. If the Trust proceeds and implements a dual-phase extraction system in the source area of the Site, resulting in an increase of discharge to 800 gallons per minute, the fees charged by the City rise to $112,000 per month and a corresponding $1,344,000 per year. Clearly these costs are prohibitive in as much as the annual discharge fees would surpass the total capital costs of implementation.

Calaveras River Discharge: The Trust investigated storm water sewer routes to an alternative discharge location to surface waters. While an alternative storm water discharge route has been identified, it would require the Trust to install conveyance piping in the City of Stockton and the County of San Joaquin right of way, a distance of over 4,000 feet to the southeast, to the Calaveras River. Directing the treated groundwater to the Calaveras River would be immensely costly, and present no real benefit to water quality.

Reuse: Regarding reuse of the discharged groundwater, the Trust considered the reuse of discharged water for landscape irrigation and groundwater recharge… However, because the Site is an operating shopping center, consisting of buildings and vast parking lots, there is a very limited amount of landscaped space at the Site relative to the quantity of water that is being generated from the remedial activities. It is unlikely that landscaping at the Site could use the entire volume of treated water. Additionally, the risk of failure or breakthrough at the treatment system may be unacceptable for this type of application.

Reinjection: Reinjection was also considered utilizing such techniques as reinjection wells, infiltration galleries, or trenches to return treated water back to the subsurface… However, there are significant technical limitations associated with reinjection, such as scaling and biofouling of the reinjection equipment and the formation adjacent to the well, gallery, or trench, which could cause reduced effectiveness relatively quickly (within months). The Trust determined that reinjection was infeasible, as there would be substantial problems at the Site associated with the location of dozens of injection wells that would be required.

The Clean Water Act mandates the implementation of effluent limitations that are as stringent as necessary to meet water quality standards established pursuant to state or federal law. (33 U.S.C., § 1311(b)(1)(C); 40 C.F.R., § 122.44(d)(1); *see also American Iron & Steel Institute* v. *EPA* (D.C. Cir. 1997) 115 F.3d 979, 990 ("[NPDES] permits must incorporate discharge limits necessary to ensure that . . . water quality standards are met. This requirement applies to narrative criteria as well as to criteria specifying maximum amounts of particular pollutants.").

Pursuant to 40 C.F.R. section 122.44(d)(1)(i), NPDES permits must contain limits that control all pollutants that "*are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute* to an excursion above any state water quality standard, including state narrative criteria for water quality." [Emphasis added.] Staff applied the beneficial uses and associated effluent limitations considering the best available information and in accordance with the Basin Plan and CWA. With the exception of the sanitary sewer disposal option, no other alternative or treatment costs were provided by the Discharger. The proposed Orders allow the Discharger sufficient time to further pursue modification of previously considered alternatives or variations of other compliance alternatives.

Consideration of Multiple Factors and Broader Water Quality Concerns

The Discharger commented that the Regional Board failed to consider the required factors contained in Water Code section 13241 during the process of developing the effluent limits contained in the

proposed Orders, and that the Regional Board has omitted any discussion of the substantial economic costs and minimal benefits of the new proposed restrictions in the proposed Order, as well as their broader environmental impacts and indirect costs

The Regional Board staff has considered the factors specified in CWC Section 13263, including considering the provisions of CWC Section 13241 where appropriate. This Order contains restrictions on individual pollutants that are no more stringent than required by the federal Clean Water Act. Individual pollutant restrictions consist of technology-based restrictions and water quality-based effluent limitations. The permit's technology-based pollutant restrictions are no more stringent than required by the Clean Water Act. Water quality-based effluent limitations have been scientifically derived to implement water quality objectives that protect beneficial uses. Both the beneficial uses and the water quality objectives have been approved pursuant to federal law and are the applicable federal water quality standards. Collectively, this Order's restrictions on individual pollutants are no more stringent than required to implement the technology-based requirements of the Clean Water Act and the applicable water quality standards for purposes of the Clean Water Act. The Regional Board must implement the CWC consistent with the CWA. The CWA precludes the consideration of costs when developing effluent limitations for NPDES permits necessary to implement water quality standards. See, e.g., *Ackels v. EPA* (9th Cir. 1993) 7 F.3d 862, 865-66.

Time Schedule Order

The Discharger commented that compliance schedules for some pollutants are improperly included in the TSO instead of the Order. Staff notes that where the Regional Board determines that it is infeasible to achieve immediate compliance with an adopted water quality objective, the Board may establish in NPDES permits a schedule of compliance. However, schedules of compliance are only authorized for those water quality objectives adopted after September 1995. The Basin Plan chemical constituents and toxicity objectives were established prior to 1995; therefore although many of the effluent limitations in this proposed Order are new, they are based on existing numeric or narrative Basin Plan standards. The proposed Time Schedule Order provides compliance schedules for pollutants where effluent limitations are based on these existing numeric or narrative Basin Plan standards.

SUMMARY

Fourteen Mile Slough is part of the Delta system, and the discharge contributes pollutants to the Delta. The point of discharge from the groundwater treatment plant to Fourteen Mile Slough is within the legal boundary of the Delta, and MUN is an existing use of the Delta. Although drinking water intakes are not currently in close proximity to the point of discharge, increasing population in the Central Valley and Stockton urban area will substantially increase the demands for drinking water. Studies conducted by the City of Stockton demonstrate that waters in proximity to the discharge are considered suitable for the MUN use and may be used for such use in the future. Regional Board staff has considered this information, and did not automatically designate the MUN use. The Clean Water Act mandates the implementation of effluent limitations that are as stringent as necessary to meet water quality standards established pursuant to state or federal law.

Staff applied the beneficial uses and associated effluent limitations considering the best available information and in accordance with the Basin Plan and CWA. This proposed Order allows the Discharger time to further pursue a variety of compliance alternatives.

RECOMMENDATION
Adopt the proposed NPDES permit and Time Schedule Order